Space Weather Forecast

Issued on Saturday, 15 April 2023 at 13:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class X-ray flares (R1-R2 Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity was Moderate, with two Moderate-class flares observed from a rapidly developing active region in the northeastern quadrant. This is one of 11 classified sunspot regions on the visible disc, with two significantly complex regions in the southeast quadrant. A complex region in the southwest has faded markedly and presents less of a flare risk, but a further region in the southwest has also developed rapidly and contain an extremely complex magnetic structure. The remaining regions are either developing slowly, or are stable and benign. A large CME (coronal mass ejection) was observed leaving the eastern limb on 14 April, accompanied by several smaller eruption, but modelling has suggested a clear miss at Earth. A further eruption from the southwest, from the region of AR3272 during 14 April will be analysed once further imagery becomes available.

Solar Wind / Geomagnetic Activity: The solar wind has been at background throughout the period, but with a slight increase at the end of the period, which could indicate a connection to a weak faster solar wind. In contrast, total magnetic field strength has been weak, with the north-south component also varying weakly. Geomagnetic activity was Quiet to Unsettled throughout the period.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is forecast to be Quiet to Moderate. This is due to a number of magnetically and visually complex regions in the eastern hemisphere and a further complex region in the western hemisphere.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 12 April may glance the Earth on 16 April, but with low confidence. The Earth could be affected by two fast solar winds during the period, but as the sources of these are at high latitudes in both the southern and northern hemispheres, any effect may just be a glance of the faster wind. The most likely scenario is for the slow wind regime to persist during the four days. Geomagnetic activity is expected to remain Quiet to Unsettled, with a chance of Active or a slight chance of G1/Minor Storms due to the possible CME glance.

Energetic Particles / Solar Radiation: Solar radiation storms are not expected and should remain at background levels, although there is a slight chance of a greater than S1 event as some of the more complex active regions transit towards the western solar hemisphere, where they are more likely to connect with the Earth.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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